09/890,084

OPIC
Office de la propriété intellectuelle du Canada

CIPO
Canadian Intellectual Property Office

Ottawa Hull K1A 0C9

(11) (C) **2,036,334**

(22) 1991/02/14

(43) 1992/08/15

(45) 1997/03/18

(52) 260-249.85
C.L. CR. 71-7.5

(51) Int.Cl.[6] C07D 251/52; A01N 43/70

(19)(CA) **CANADIAN PATENT** (12)

(54) Substituted Phenylsulphonyltriazinylureas, Salts Thereof and Agent for Plant Growth Stimulation and Inhibition Based Thereon

(72) Sorokin, Vladimir Iosifovich , USSR
Kuznetsova, Galina Vladimirovna , USSR
Rusakova, Natalya Ionovna , USSR
Tsybalova, Ljubov Alexandrovna , USSR
Melikhova, Irina Nikolaevna , USSR
Granina, Tatyana Evgenievna , USSR
Drozd, Viktor Nikolaevich , USSR
Shapovalov, Alexandr Alexeevich , USSR
Loi, Nelli Pavlovna , USSR
Shvareva, Tatyana Anatolievna , USSR
Petunova, Angelina Alexandrovna , USSR
Khomyak, Julian Dmitrievich , USSR
Kravchenko, Nikolai Sidorovich , USSR
Mily, Vladimir Vladimirovich , USSR
Barashkin, Vyacheslav Alexeevich , USSR
Frolova, Margarita Mikhailovna , USSR
Bezsolitsen, Vladimir Pavlovich , USSR

(73) VSESOJUZNY NAUCHNO-ISSLEDOVATELSKY INSTITUT KHIMICHESKIKH SREDSTV ZASCHITY RASTENY , USSR

(57) 4 Claims

NO DRAWING

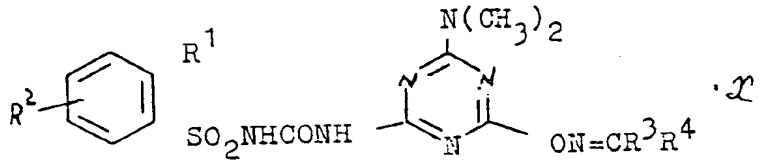
2036334

18 MARS 1997

SUBSTITUTED PHENYLSULPHONYLTRIAZINYL UREAS, SALTS THEREOF AND AGENT FOR PLANT STIMULATION AND INHIBITION BASED THEREON

A B S T R A C T

Substituted phenylsulphonyltriazinyl ureas and their salts of the general formula:

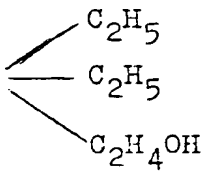


wherein: R^1 = Cl, NO_2, $COOCH_3$;

R^2 = H, Cl;

R^3 = H, CH_3;

R^4 = CH_3, C_2H_5, C_6H_5, C_oH_4Cl-2 and X is absent, or

X = K, Na, 

The agent for plant growth stimulation and inhibition incorporates, as the active principle, substituted phenylsulphonyl ureas or salts thereof of the above-given general formula.

2036334

SUBSTITUTED PHENYLSULPHONYLTRIAZINYLUREAS, SALTS THEREOF AND AGENT FOR PLANT GROWTH STIMULATION AND INHIBITION BASED THEREON

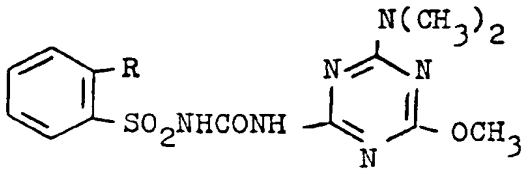
The present invention relates to organic chemistry and, more specifically, to novel compounds - substituted phenylsulphonyltriazinylureas, their salts and an agent for plant growth stimulation and inhibition based thereon.

An important problem in agriculture is increasing yield of crops. For this purpose plant-growth stimulants and herbicides are employed.

A simultaneous use of herbicides and growth stimulants brings about certain difficulties, since specificity of their effect depends on the variety of the treated farm crop.

Known in the art are different compounds featuring a herbicidal activity. Thus, known in the art is a compound, viz. 1-(2-chlorobenzenesulphonyl)-3-(4-methyl-6-methoxy-1,3,5-triazin-2-yl)-urea. A preparation based on this compound is useful in agriculture for protection of sawings of wheat, barley, rye, oats and lin from weeds (US, A, 4127405).

Also known are compounds which possess, apart from their herbicidal activity, properties of plant growth regulators as well. As a rule, the effect of these compounds is accompanied by retardation, growth-inhibition and formative effects. Such compounds may be exemplified by arylsulphonylurea derivatives of the general formula:



wherein: R = Cl, CO_2CH_3, CH_3

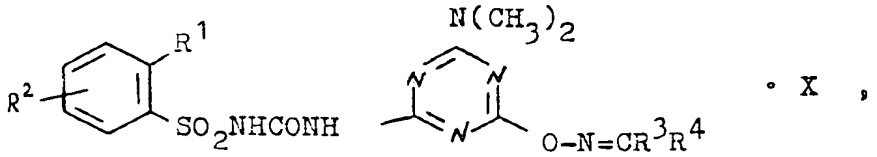
In a dose of from 60 to 400 g/ha such compounds display herbicidal properties and possess retardation, growth-inhibition or growth-formation effects (US, A, 4231784).

However, these prior art compounds inhibit growth of farm crops.

The compounds according to the present invention are novel and hitherto unknown from the literature.

It is an object of the present invention to provide novel compounds possessing growth-stimulation activity with a simultaneous herbicidal effect.

This object is accomplished by novel compounds, viz. substituted phenylsulphonyltriazinylureas and salts thereof corresponding to the general formula:

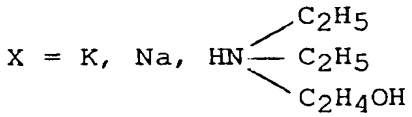


R^1 = Cl, NO_2, $COOOH_3$,

R^2 = H, Cl,

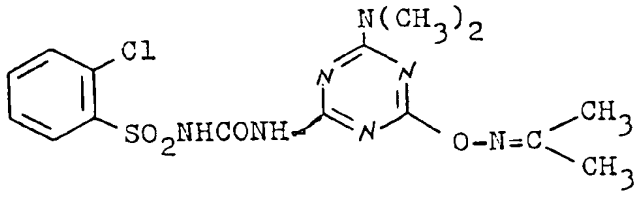
R^3 = H, CH_3

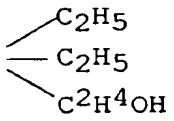
R^4 = CH_3, C_2H_5, C_6H_5, C_6H_4Cl-2; X is absent, or



The compounds according to the present invention show growth-stimulant and herbicidal activity.

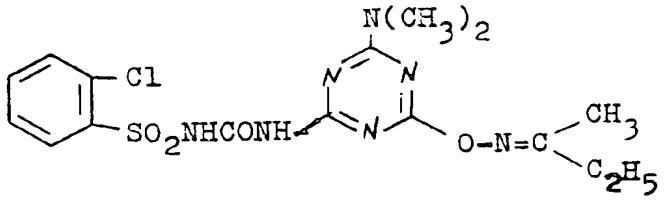
An agent for stimulation and inhibition of plant growth incorporating an active principle and a diluent, according to the present invention contains as the active principle the compounds according to the present invention - substituted phenylsulphonyl-triazinylurea or salts thereof. Preferably, the agent according to the present invention incorporates, as the active principle, 1-(2-chlorobenzene-sulphonyl)-3-(4-dimethylamino-6-isopropylidene-iminooxy-1,3,5-triazin-2-yl)-urea or its potassium, sodium or diethylethanolammonium salt of the following formula:



wherein X is absent or X = K, Na, 

The compound according to the present invention may also incorporate, preferably, as the active principle 1-(2-chlorobenzenesulphonyl)-3-[4-di-methylamino-(α-methyl)-propylideneiminooxy-1,3,4-triazin-2-yl]-urea or its potassium, sodium or

ethanol,
diethylammonium salt of the following formula:

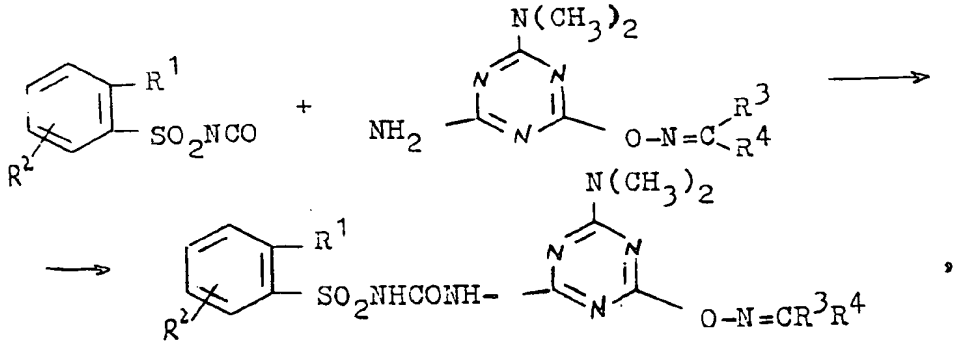


wherein X is absent, or X = K, Na, HN(C_2H_5)(C_2H_5)(C_2H_4OH)

The compounds according to the present invention have a high activity and are used for stimulation and inhivition of plant growth.

The novel compounds according to the present invention - substituted phenylsulphonyltriazinylureas are stable white crystalline substances sparingly soluble in water and in organic solvents.

The compounds according to the present invention - substituted phenylsulphonyltriazinylureas are prepared by reacting substituted benzenesulphonylisocyanates with substituted 2-amino-1,3,5-triazines:



wherein R' = Cl, NO_2, $COOH_3$,

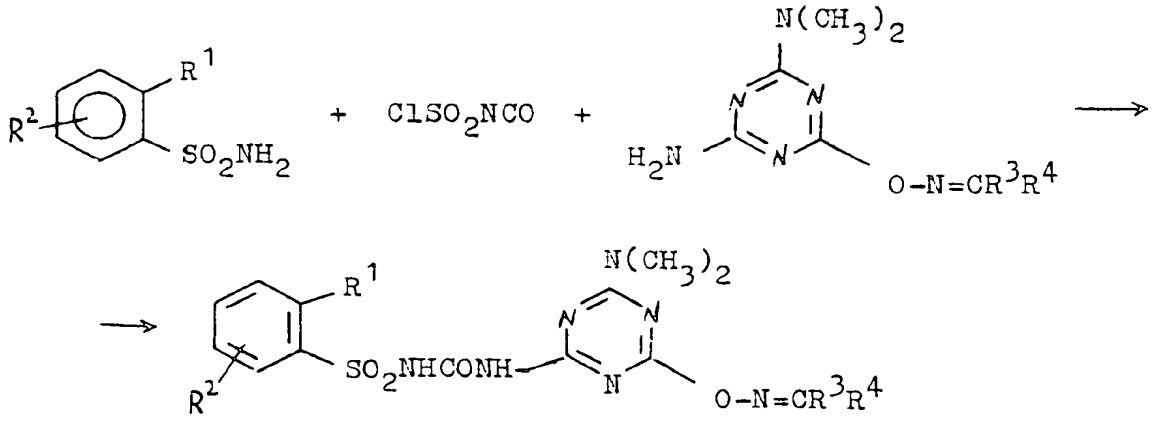
R^2 = H,Cl,

R^3 = H, CH_3

R^4 = CH_3, C_2H_5, C_6H_5, C_6H_4Cl-2

The starting components are employed in the weight ratio of 1:1. The process is conducted in an organic solvent (benzene, xylene, toluene, acetonitrile, tetrahydrofuran) in the presence of catalytical amounts of tetramethylethylenediamine at a temperature of from 50 to 60°C for 2 hours. Then the reaction mass temperature is lowered to 20°C and the mass is stirred for additional 2 hours till completion of the reaction. The precipitate is filteredoff, washed with the solvent in which the reaction has been carried out and dried.

The compounds according to the present invention can be also prepared by reacting a substituted arylsulphonamide with chlorosulphonylisocyanate and substituted 2-amino-1,3,5-triazine in an organic solvent (toluene, xylene) at a temperature of 60-70°C for 3 hours.



wherein: R^1 = Cl_1NO_2, $COOCH_3$

R^2 = H Cl

R^3 = H, CH_3

R^4 = CH_3, C_2H_5, C_6H_5, C_6H_4Cl-2

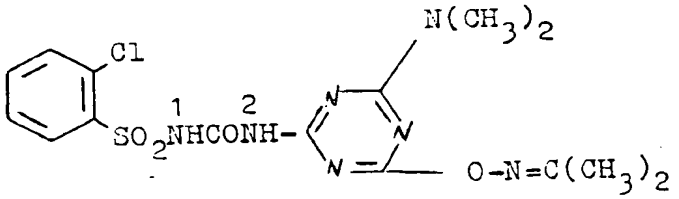
The structures of the synthesized substituted phenylsulphonyltriazinylureas have been proven by methods of elemental analysis, IR- and PMR-spectroscopy. IR-spectra were taken by means of a "PYE UNICAM" instrument using KBr tablets. PMR-spectra were taken by means of a "WM-250" instrument in deuteroacetone using tetramethylsilane as an internal standard reference. Given as an example is a PMR-spectrum of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea, wherein there are signals from protons of the isopropylidene group at 2.04 ppm (s), 6H of dimethylamino group at 3.11 ppm (d), 6H signals from protons of the phenyl ring at 7.5-7.7 ppm (m), 3H and 8.22 ppm (d, d) H^6. The signals from protons of two NH groups are observed at 9.33 ppm (s) 1H and 13.59 ppm (s) 1H. The location of these signals was unambiguously proven by means of synthesized sulphonylurea tagged by ^{15}N isotope at the nitrogen atom of the sulphamide group. The spin-spin cleavage ^{15}N-H signal at 13.59 ppm equal to 90 Hz has made it possible to unambiguously assign this resonance signal to hydrogen of the sulphamide group.

The salts of substituted phenylsulphonyltriazinylureas are crystalline substances soluble in water and in some organic solvents such as alcohols, glycols, sulphoxides.

The salts according to the present invention are prepared by reacting substituted phenylsulphonyltriazinylureas with an al-

kali metal (potassium or sodium) hydroxide or diethylethanolamine at the mass ratio of 1:1.1 in an organic solvent (alcohols) or in water at a temperature of from 35 to 40°C for 3 hours. The structure of the claimed salts was verified by methods of PMR and IR-spectroscopy. Thus, in a PMR-spectrum of sodium salt of 1-(2-shlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl) urea taken in deuteroacetone the signal from proton at N-1 atom disappears. In the reaction of the substituted ureas according to the present invention with fatty amines oily compounds are formed. Elemental analysis of, for example, a product of the reaction of diethylethanolamine and the above mentioned substituted urea points to the formation of an adduct of the reactants in the ratio of 1:1. In a PMR-spectrum of this adduct taken in deuteroacetone there are no signals of protons of both amide groups which points to the formation of a compound having a salt-like character.

Given hereinbelow are the data of NMR-spectra of the above-mentioned substituted urea according to the present invention and its sodium and diethylethanolamine salts:



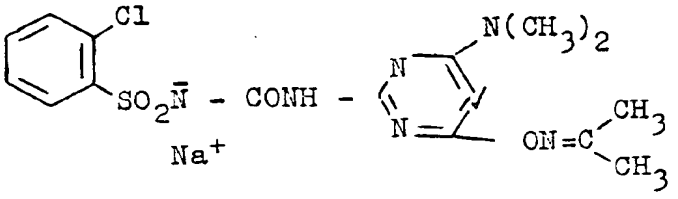
δ 2.03d, $C(CH_3)_2$

3.11d, $N(CH_3)_2$

7.69-8.13m, Ar

10.69c NH_1

13.61c, NH_2

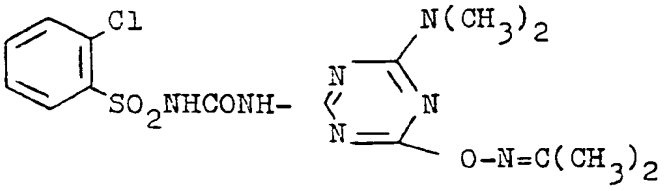


δ: 2.05 c, $C(CH_3)_2$

3.08 d, $N(CH_3)_2$

7.58-8.03 m, Ar

9.13 c, NH



1.18 c, $CH_3(C_2H_5)$

2.02 d, $C(CH_3)_2$(Het)

2.98 q, $CH_2(C_2H_5)$

$(C_2H_5)_2 N CH_2CH_2OH$

3.15 d, $N(CH_3)_2$

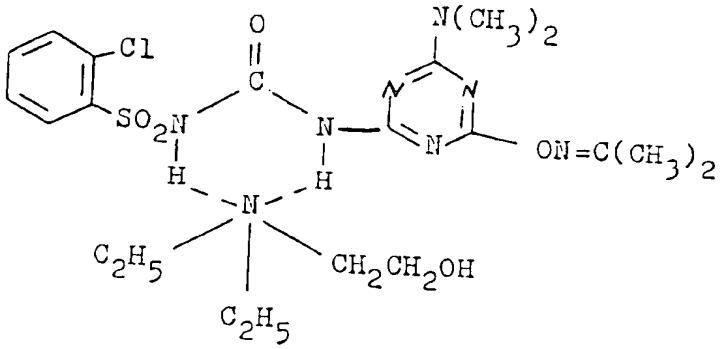
3.8 m, CH_2CH_2

6.35 c, OH

7.5-8.1 m, Ar

The NMR ^1H spectra were taken by means of a "WM-250" instrument at the frequency of 250.13MHz for H^+.

The above-given data enable assumption of the following structure for the salt according to the present invention:



All the compounds according to the present invention exhibit a plant growth-stimulant and growth-inhibiting activity.

The compounds according to the present invention are active principles of compositions intended for stimulation and inhibition of plant growth. The activity of the compounds according to the present invention and of agents based thereon was studied on plants under laboratory and field conditions.

The compounds according to the present invention are capable of substantially accelerating the development of some farm plants during earlier stages of organogenesis, thus resulting in the formation of larger-size plants, i.e. the compounds according to the present invention selectively stimulate only farm crops simultaneously inhibiting the growth and development of weeds.

The compounds according to the present invention were subjected to biological tests on grain crops (for example, wheat, barley), corn and cotton. It was revealed that the compounds according to the present invention were superior to the known preparations such as GLIN*, GIBBERELIN* and ATRAZIN* in their

* Trade Mark

herbicidal and growth-stimulant activity.

Gibberelin, while causing elongation of the stem, produced no positive effect on the biomass of the above-earth part of the plant, wherefore they were formed thinned and lodging. Atrazin produced an effect similar to that of the compounds according to the present invention, but in 10 and 25 times greater doses.

All the compounds according to the present invention are low-toxic, the LD_{50} on white mice intramuscularly is over 5,000 mg/kg. An agent based on the compounds according to the present invention can be used as wettable powders, granules and solutions. The compound according to the present invention is intended for the treatment of both green plants and the soil by methods of spraying, powdering, wetting or pelletizing of seeds.

For a better understanding of the present invention, some specific examples illustrating preparation of the compounds, testing of their activity and use are given hereinbelow.

Example 1

1-(2-Chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea /Compound I/.

To a suspension of 9.57 g (0.05 mol) of 2-chlorobenzenesulphonamide and 0.3 ml of tetramethylethylenediamine in 100 ml of o-xylene there were added 7.1 g (0.05 mol) of chlorosulphonylisocyanate at the temperature of 20°C. The reaction mixture was heated for 3 hours at a temperature of 95-100°C, cooled and added with 11.2 g (0.05 mol) of 2-amino-4-dimethyl-amino-

6-isopropylideneiminooxy-1,3,5-triazine; the mixture was heated for 3 hours at a temperature of 50 to 60°C, cooled; the precipitate was filtered-off to give 17.0 g (80%) of compound I, m.p. 184-186°C (from acetonitrile).

Found, %: C 41.94, H 4.34, N 22.81, Cl 6.96, S 8.14.

$C_{15}H_{18}ClN_7O_4S$.

Calculated, %: C 42.11, H 4.24, N 22.92, Cl 8.28, S 7.50.

Example 2

1-(2-Chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound I).

To a suspension of 19.0 g (0.09 mol) of 2-amino-4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazine in 50 ml of benzene heated to the remperature of 60°C a sulution of 21.7 g (0.1 mol) of 2-chlorobenzenesulphonylisocyanate in 100 ml of benzene was gradually added. The reaction mass was stirred for 3 hours at a temperature of 60-70°C and then for 2 hours at room temperature. The precipitate was filtered-off, washed with benzene and dried to give 36.5 g (95%) of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea, m.p. 184-186°C. The data of elemental analysis were similar to those give in Example 1 hereinabove.

Example 3

1-(2-Chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methul)-propylideneiminooxy-1,3,5-triazin-2-yl] -urea (Compound 2).

To a suspension of 2.06 g (0.0092 mol) of 2-amino-4-dimethylamino-6-(α -methyl)propylideneiminooxy-1,3,5-triazine in

40 ml of dry benzene 1 drop of tetramethylethylenediamine was added, the mixture was heated to a temperature of 50-60°C and added with 2,15 g (0.0099 mol) of 2-chlorobenzenesulphonylisocyanate. The reaction mixture was stirred for 2 hours at the temperature of 60°C and for 2 hours at the temperature of 20°C, the precipitate was filtered-off to give 4.0 g (95%) of compound 2, m.p. 172-173°C (decomp.).

Found, %: C 43.22, H 4.68, N 22.31, Cl 7.81, S 7.46.

$C_{16}H_{20}ClN_7O_4S$.

Calculated, %: C 43.49, H 4.56, N 22.19, Cl 8.02, S 7.25.

Example 4.

1-(2-Chlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 3).

In a manner similar to that described in Example 2 hereinbefore from 2-chlorobenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazine the above-identified urea was obtained, m.p. 178°C, the yield quantitative.

Found, %: C 47.67, H 4.05, N 20.65, Cl 7.61, S 6.75

$C_{19}H_{18}Cl_1N_7O_4S$.

Calculated, %: C 47.95, H 3.81, N 20.65, Cl 7.45, S 6.73.

Example 5

1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 4).

In a manner similar to that discribed in Example 2 hereinbefore, from 2-chlorobenzenesulphonylisocyanate and 2-amino-

4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazine the above-identified urea was obtained, m.p. 167-168°C, the yield 96.5%.

Found, %: C 44.80, H 3.64, N 18.94, Cl 13.76, S 6.34.

$C_{19}H_{17}Cl_2N_7O_4S$.

Calculated, %: C 44.71, N 19.22, H 3.36, Cl 13.89,
S 6.28.

Example 6

1-(2-Nitrobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)urea (Compound 5).

In a manner similar to that described in Example 2 hereinbefore, from 2-nitrobenzene-sulphonylisocyanate and 2-amino-4-dimethylamino-6-isopropylideniminooxy-1,3,5-triazine the above-identified urea was obtained, m.p. 190-192°C, yield 88%.

Found, %: C 40.87, H 4.21, N 25.35, S 7.46.

$C_{15}H_{18}N_8O_6S$.

Calculated, %: C 41.09, H 4.14, N 25.87,
S 7.31.

Example 7

1-(2-Nitrobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]urea (compound 6).

In a manner similar to that of Example 2, from 2-nitrobenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazine the above-identified urea was obtained, m.p. 187-189°C, yield 85%.

Found, %: C 41.92, H 4.39, N 24.16, S 7.11.

$C_{16}H_{20}N_8O_6S$.

Calculated, %: C 42.48, H 4.46, N 24.77,
S 7.08.

Example 8

1-(2-Nitrobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 7).

In a manner similar to that of Example 2, from 2-nitrobenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazine the above-identified urea was obtained, m.p. 194-196°C, yield 82%.

Found, %: C 46.73, H 3.69, N 23.02, S 6.61. $C_{19}H_{18}N_8O_6S$.

Calculated, %: C 46.91, H 3.73, N 23.03, S 6.59.

Example 9

1-(2-Methopxycarbonylbenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 8).

In a manner similar to that of the foregoing Example 2, from 2-methoxycarbonylbenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazine the above-identified urea was obtained, m.p. 187-189°C, yield 90%.

Found, %: C 45.5, H 5.0, N 21.57, S 7.24. $C_{17}H_{21}N_7O_6S$.

Calculated, %: C 45.23, H 4.69, N 21.72, S 7.10.

Example 10

1-(2-Methoxycarbonylbenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 9).

In a manner similar to that described in Example 2 hereinbefore from 2-methoxycarbonylbenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazine the above-mentioned urea was obtained, m.p. 170°C (decomp.), yield 92%.

X

Found, %: C 46.51, H 5.08, N 21.08, S 6.62. $C_{18}H_{23}N_7O_6S$.

Calculated, %: C 46.45, H 4.98, N 21.06, S 6.89.

Example 11

1-(2-Methoxycarbonylbenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 10).

In a manner similar to that described in Example 2 hereinbefore, from 2-methoxycarbonylbenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazine the above-mentioned urea was obtained, m.p. 163-164°C (decomp.), yield 91%.

Found, %: C 50.27, H 4.36, N 19.84, S 6.13. $C_{21}H_{21}N_7O_6S$.

Calculated, %: C 50.50, H 4.24, N 19.68, S 6.42.

Example 12

1-(2-Methoxycarbonylbenzenesulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 11).

In a manner similar to that of Example 2 hereinbefore, from 2-methoxycarbonylbenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazine the above-identified urea was obtained, m.p. 162-163°C (decomp.), yield 96%.

Found, %: C 47.64, H 3.93, N 18.64, Cl 6.26, S 5.75.

$C_{21}H_{20}ClN_7O_6S$.

Calculated, %: C 47.24, H 3.78, N 18.36, Cl 6.64, S 6.0.

Example 13

1-(2,5-Dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopro-

pylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 12)

In a manner similar to that of Example 2 from 2,5-dichlorbenzenesulphonylisocyanate and 2-animo-4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazine the above-mentioned urea was obtained, m.p. 170-172°C, yield 90%.

Found, %: C 38.81, H 3.48, Cl 15.01, N 20.96.

$C_{15}H_{17}Cl_2N_7O_4S$.

Calculated, %: C 38.97, H 3.77, Cl 15.96, N 21.21.

Example 14

1-(2,5-Dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 13).

In a manner similar to that described in Example 2, from 2,5-dichlorobenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazine the above-identified urea was obtained, m.p. 154-156°C, yield 92%.

Found, %: C 40.68, H 4.05, N 20.55, Cl 14.54, S 6.15.

$C_{16}H_{19}Cl_2N_7O_4S$.

Calculated, %: C 40.34, H 4.02, N 20.59, Cl 14.88, S 6.73.

Example 15

1-(2,5-Dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 14).

In a manner similar to that described in Example 2 hereinbefore, from 2,5-dichlorobenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazine the above-mentioned urea was obtained, m.p. 180-182°C, yield 87%.

Found, %: C 44.51, H 3.08, Cl 13.82, N 18.96.

$C_{19}H_{17}Cl_2N_7O_4S$.

Calculated, %: C 44.72, H 3.36, Cl 13.89, N 19.22.

Example 16

1-(2,6-Dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl) urea (Compound 15).

In a manner similar to that described in Example 2, from 2,6-dichlorobenzenesulphonylisocyanate and 2-amino-4-dimethyl-amino-6-isopropylideneiminooxy-1,3,5-triazine the above-mentioned urea was obtained, m.p. 168-170°C, yield 85%.

Found, %: C 40.12, H 3.9, Cl 15.54, N 21.54.

$C_{15}H_{17}Cl_2N_7O_4S$.

Calculated, %: C 38.97, H 3.71, Cl 15.34, N 21.21.

Example 17

1-(2,6-Dichlorobenzenesulphonyl)-3- [4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl] -urea (Compound 16).

In a manner similar to that described in Example 2 hereinbefore, from 2,6-dichlorobenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazine the above-mentioned urea was obtained, m.p. 164-166°C yield 86%.

Found, %: C 40.62, H 4.08, Cl 15.20, N 20.81.

$C_{16}H_{19}Cl_2N_7O_4S$.

Calculated, %: C 40.34, H 4.02, Cl 14.88, N 20.59.

Example 18

1-(2,6-Dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 17)

In a manner similar to that of Example 2, from 2,6-dichlorobenzenesulphonylisocyanate and 2-amino-4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazine the above-mentioned urea was obtained, m.p. 171-173°C, yield 89%.

Found, %: C 44.98, H 3.70, Cl 14.12, N 19.49.

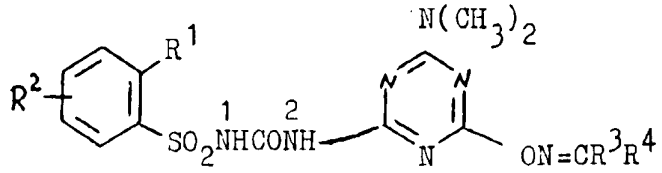
$C_{19}H_{17}Cl_2N_7O_4S$.

Calculated, %: C 44.72, H 3.36, Cl 13.83, N 19.22.

The IR- and PMR-spectra of substituted phenylsulphonyltriazinylureas are shown in Table 1 hereinbelow.

Table 1

IR- and PMR-spectra of substituted phenylsulphonyltriazinyl ureas



No.	R^1	R^2	R^3	R^4	IR-spectrum, cm^{-1}			PMR-spectrum, ppm	
					ν SO_2	ν C=N	ν CO	δ^1 NH	δ^2 NH
1	2	3	4	5	6	7	8	9	10
1.	Cl	H	CH_3	CH_3	1,360 1,160	1,450 1,623	1,721	13.59	9.33
2.	Cl	H	CH_3	C_2H_5	1,367 1,178	1,450 1,618	1,710	13.62	9.28
3.	Cl	H	H	C_6H_5	1,365 1,180	1,460 1,605	1,705	13.82	9.61
4.	Cl	H	H	C_6H_4Cl-2	1,365 1,178	1,470 1,605	1,705	13.85	9.66

2036334

Table 1 (Continued)

1	2	3	4	5	6	7	8	9	10
5.	NO_2	H	CH_3	CH_3	1,365 1,170	1,455 1,605	1,712	13.60	10.65
6.	NO_2	H	CH_3	C_2H_5	1,360 1,170	1,460 1,600	1,715	13.66	10.15
7.	NO_2	H	H	C_6H_5	1,375 1,180	1,480 1,610	1,712	13.91	9.85
8.	CO_2CH_3	H	CH_3	CH_3	1,362 1,173	1,472 1,614	1,738 1,704	13.08	8.75
9.	CO_2CH_3	H	CH_3	C_2H_5	1,363 1,165	1,465 1,616	1,726 1,708	13.01	8.80
10.	CO_2CH_3	H	H	C_6H_5	1,360 1,165	1,465 1,615	1,732 1,705	13.90	8.80
11.	CO_2CH_3	H	H	C_6H_4Cl-2	1,363 1,165	1,465 1,610	1,725 1,708	13.88	8.92
12.	Cl	5-Cl	CH_3	CH_3	1,370 1,182	1,460 1,595	1,703	13.62	9.21
13.	Cl	5-Cl	CH_3	C_2H_5	1,380 1,160	1,455 1,600	1,710	13.65	9.25

Table 1 (Continued)

1	2	3	4	5	6	7	8	9	10
14.	Cl	5-CI	H	C_6H_5	1,370 1,175	1,460 1,605	1,708	13.95	9.91
15.	Cl	6-CI	CH_3	CH_3	1,368 1,180	1,450 1,600	1,705	13.58	9.35
16.	Cl	6-CI	CH_3	C_2H_5	1,370 1,182	1,460 1,604	1,708	13.61	9.41
17.	Cl	6-CI	H	C_6H_5	1,360 1,180	1,465 1,610	1,705	13.62	9.72

Example 19

Sodium salt of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 18).

To a solution of 0.6 g (0.015 mol) of sodium hydroxide in 20 ml of water 4.28 g (0.01 mol) of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea were portion-wise added under stirring. The reaction mixture was stirred at a temperature of 40-45°C for 3 hours till dissolution of sulphonylurea. The resulting reaction mass was filtered, water was evaporated under a reduced pressure and at a temperature of not over 50°C. The precipitate was washed with ether, dried in vacuum to give 4.3 g (90%) of the above-specified salt, m.p. 178°C (decomp).

Found, %: C 40.21, H 3.96, N 22.0, S. 7.36. $C_{15}H_{17}ClN_7O_4SNa$.

Calculated, %: C 40.04, H 3.78, N 21.8, S 7.12.

Example 20

Sodium salt of 1-(2-chlorobenzylsulphonyl)-3-[4-dimethylamino-6-(α-methyl)propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 19).

In a manner similar to that described in the foregoing Example 19, from sodium hydroxide and 1-(2-chlorobenzene-sulphonyl)-3-(4-dimethylamino-6-(α-methyl)-propylideneiminooxy--1,3,5-triazin-2-yl)-urea the above-identified salt was obtained in the yield of 92%, m.p. 161°C (decomp.).

Found, %: C 41.42, H 4.09, Cl 7.66, N 21.14.

$C_{16}H_{19}ClN_7O_4SNa$.

Calculated, %: C 41.48, H 4.13, Cl 7.59, N 21.28.

Example 21

Sodium salt of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 20)

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2yl)-urea the above-identified salt was obtained in the yield of 98%, m.p. 156°C (decomp.).

Found, %: C 45.83, H 3.42, Cl 7.13, N 19.69.

$C_{19}H_{17}ClN_7O_4SNa$.

Calculated, %: C 45.91, H 3.48, Cl 7.31, N 19.66.

Example 22

Sodium salt of 1-(2-chlorobenzenesulphonyl)-3- [4-dimethylamino-6-(2-chloro)benzylideneiminooxy-1,3,5-triazin-2-yl] -urea (Compound 21).

In a manner similar to that described in Example 19, from sodium hydroxide and 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-(2-chloro)benzylideneiminooxy-1,3,5-triazin-2-yl) urea the above-mentioned salt was obtained in the yield of 95%, m.p. 159°C (decomp.).

Found, %: C 42.73, H 3.06, Cl 13.41, N 18.56.

$C_{19}H_{16}Cl_2N_7O_4SNa$.

Calculated, %: C 42.86, H 3.00, Cl 13.35, N 18.42.

Example 23

Sodium salt of 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 22).

In a manner similar to that of Example 19 hereinbefore, from sodium hydroxide and 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 95%, m.p. 184°C (decomp.).

Found, %: C 39.23, H 3.73, N 24.63, S 6.73. $C_{15}H_{17}N_8O_6SNa$.

Calculated, %: C 39.1, H 3.69, N 24.35, S 6.96.

Example 24

Sodium salt of 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 23).

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2-nitrobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1, 3,5-triazin-2-yl] urea the above-mentioned salt was obtained in the yield of 92%, m.p. 184°C (decomp.).

Found, %: C 40.5, H 4.01, N 23.63, S 6.75. $C_{16}H_{19}N_8O_6SNa$.

Calculated,%: C 40.61, H 4.19, N 23.72, S 6.69.

Example 25

Sodium salt of 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 24).

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 94%, m.p. 185°C (decomp.)

Found, %: C 44.91, H 3.88, N 22.31. $C_{19}H_{17}N_8O_6SNa$.

Calculated, %: C 44.88, H 3.74, N 22.04.

Example 26

Sodium salt of 1-(2-methoxycarbonylbenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 25).

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2-methoxycarbonylbenzenesulphonyl-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 94%, m.p. 162°C (decomp.).

Found, %: C 43.12, H 4.23, N 21.72, S 6.76. $C_{17}H_{20}N_7O_6SNa$.

Calculated, %: C 43.06, H 4.39, N 21.83, S 6.82.

Example 27

Sodium salt of 1-(2-methoxycarbonylbenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compond 26).

In a manner similar to that described in Example 19, from sodium hydroxide and 1-(2-methoxycarbonylbenzenesulphonyl-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yiled of 92%, m.p. 151°C (decomp.)

Found, %: C 44.35, H 4.52, N 20.12, S 6.57. $C_{18}H_{22}N_7O_6SNa$.

Calculated, %: C 44.49, H 4.41, N 20.18, S 6.83.

Example 28

Sodium salt of 1-(2-methoxycarbonylbenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 27).

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2-methoxycarbonylbenzene-sulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 93%, m.p. 154°C (decomp.).

Found, %: C 48.37, H 3.83, N 18.81, S 6.14. $C_{21}H_{20}N_7O_6SNa$.

Calculated, %: C 48.43, H 3.96, N 18.91, S 6.29.

Example 29

Sodium salt of 1-(2-methoxycarbonylbenzene-sulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzyl-ideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 28).

In a manner similar to that described in Example 19, from sodium hydroxide and 1-(2-methoxy-carbonylbenzenesulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yield of 95%, m.p. 157°C (decomp.).

Found, %: C 45.36, H 3.42, Cl 6.39, N 17.64. $C_{21}H_{19}ClN_7O_6SNa$.

Calculated, %: C 45.53, H 3.48, Cl 6.44, N 17.59.

Example 30

Sodium salt of 1-(2,5-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 29).

In a manner similar to that of Example 19, from sodium hydroxyide and 1-(2,5-dichlorobenzene-sulphonyl)-3-(4-dimethylamino-6-isopropylidene-iminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 91%, m.p. 165°C (decomp.).

Found, %: C 37.19, H 3.3, Cl 14.67, N 20.25. $C_{15}H_{16}Cl_2N_7O_4SNa$.

Calculated, %: C 37.41, H 3.29, Cl 14.36, N 20.43.

Example 31

Sodium salt of 1-(2,5-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 30).

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2,5-dichlorobenzene-sulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-identified salt was obtained in the yield of 92%, m.p. 151°C (decomp.).

Found, %: C 38.55, H 3.61, Cl 14.26, N 19.68. $C_{16}H_{18}Cl_2N_7O_4SNa$.

Calculated, %: C 38.41, H 3.79, Cl 14.31, N 19.74.

Example 32

Sodium salt of 1-(2,5-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 31).

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2,5-dichlorobenzene-sulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 93%, m.p. 174°C (decomp.).

Found, %: C 42.86, H 3.01, Cl 13.35, N 18.42. $C_{19}H_{16}Cl_2N_7O_4SNa$.

Calculated, %: C 42.71, H 3.31, Cl 13.21, N 18.31.

Example 33

Sodium salt of 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 32).

In a manner similar to that described in example 19 hereinbefore, from sodium hydroxide and 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-

isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 92%, m.p. 157°C (decomp.).

Found, %: C 37.19, H 3.3, Cl 14.67, N 20.24. $C_{19}H_{18}Cl_2N_7O_4SNa$.

Calculated, %: C 37.48, H 3.49, Cl 14.53, N 20.44.

Example 34

Sodium salt of 1-(2,6-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 33).

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2,6-dichlorobenzene-sulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yield of 92%, m.p. 160°C (decomp.).

Found, %: C 38.55, H 3.61, Cl 14.25, N 19.68. $C_{16}H_{18}Cl_2N_7O_4SNa$.

Calculated, %: C 38.63, H 3.76, Cl 14.59, N 19.67.

Example 35

Sodium salt of 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 34).

In a manner similar to that of Example 19, from sodium hydroxide and 1-(2,6-dichlorobenzene-sulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 92%, m.p. 167°C (decomp.).

Found, %: C 42.86, H 3.01, Cl 13.35, N 18.42. $C_{19}H_{16}Cl_2N_7O_4SNa$.

Calculated, %: C 42.93, H 3.13, Cl 13.49, N 18.91.

Example 36

Potassium salt of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 35).

To a solution of 0.84 g (0.015 mol) of potassium hydroxide in 25 ml of water 4.28 g (0.01 mol) of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea were portion-wise added under stirring. The reaction mixture was stirred at a temperature of 40-45°C for 3 hours till dissolution of sulphonylurea. The resulting reaction mass was filtered, water was evaporated under a reduced pressure and at a temperature of not more than 50°C. The precipitate was washed with ether, dried in vacuum to give 4.5 g (90%) of the above-mentioned salt, m.p. 181°C (decomp.).

Found, %: C 38.81, H 3.63, N 20.97, S 6.98. $C_{15}H_{17}ClN_7O_4SK$.

Calculated, %: C 38.67, H 3.65, N 21.05, S 6.87.

Example 37

Potassium salt of 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 36).

In a manner similar to that of the foregoing Example 36, from potassium hydroxide and 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yield of 92%, m.p. 163°C (decomp.).

Found, %: C 40.15, H 3.90, Cl 7.19, N 20.51. $C_{16}H_{19}ClN_7O_4SK$.

Calculated, %: C 40.04, H 3.96, Cl 7.4, N 20.43.

Example 38

Potassium salt of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5,-triazin-2-yl)-urea (Compound 37).

In a manner similar to that described in the foregoing Example 36, from potassium hydroxide and 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 94%, m.p. 169°C (decomp.).

Found, %: C 44.59, H 3.43, Cl 6.72, N 18.95. $C_{19}H_{17}ClN_7O_4SK$.

Calculated, %: C 44.4, H 3.31, Cl 6.91, N 19.08.

Example 39

Potassium salt of 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 38).

In a manner similar to that of Example 36, from potassium hydroxide and 1-(2-chlorobenzenesulphonyl-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yield of 91%, m.p. 164°C (decomp.).

Found, %: C 41.74, H 2.85, Cl 12.82, N 17.70. $C_{19}H_{17}ClN_7O_4SK$.

Calculated, %: C 41.6, H 2.92, Cl 12.96, N 17.88.

Example 40

Potassium salt of 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 39).

In a manner similar to that described in Example 36, from potassium hydroxide and 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea the

above-mentioned salt was obtained in the yield of 93%, m.p. 186°C (decomp.).

Found, %: C 37.69, H 3.49, N 23.68, S 6.59. $C_{15}H_{17}N_8O_6SK$.

Calculated, %: C 37.82, H 3.57, N 23.53, S 6.72.

Example 41

Potassium salt of 1-(2-nitrobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 40).

In a manner similar to that of Example 36, from potassium hydroxide and 1-(2-nitrobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylidene-iminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yield of 95%, m.p. 189°C (decomp.).

Found, %: C 39.35, H 3.76, N 22.72, S 6.70. $C_{16}H_{19}N_8O_6SK$.

Calculated, %: C 39.18, H 3.88, N 22.86, S 6.53.

Example 42

Potassium salt of 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 41).

In a manner similar to that described of Example 36, from potassium hydroxide and 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 91%, m.p. 187°C (decomp.).

Found, %: C 43.65, H 3.71, N 21.25, S 6.06. $C_{19}H_{17}N_8O_6SK$.

Calculated, %: C 43.51, H 3.62, N 21.73, S 6.11.

Example 43

Potassium salt of 1-(2-methoxycarbonylbenzene-sulphonyl)-3-(4-dimethylamino-6-isopropylidene-iminooxy-1,3,5-triazin-2-yl)-urea (Compound 42).

In a manner similar to that of Example 36, from potassium hydroxide and 1-(2-methoxycarbonylbenzene-sulphonyl)-3-(4-dimethylamino-6-isopropylidene-iminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 92%, m.p. 168°C (decomp.).

Found, %: C 41.58, H 4.02, N 20.34, S 6.58. $C_{17}H_{20}N_7O_6SK$.

Calculated, %: C 41.71, H 4.08, N 20.16, S 6.54.

Example 44

Potassium salt of 1-(2-methoxycarbonylbenzene-sulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 43).

In a manner similar to that of Example 36, from potassium hydroxide and 1-(2-methoxycarbonylbenzene-sulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt is obtained in the yield of 93%, m.p. 153°C (decomp.).

Found, %: C 42.71, H 4.42, N 19.61, S 6.22. $C_{18}H_{22}N_7O_6SK$.

Calculated, %: C 42.9, H 4.37, N 19.48, S 6.36.

Example 45

Potassium salt of 1-(2-methoxycarbonylbenzene-sulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 44).

In a manner similar to that of Example 36, from potassium hydroxide and 1-(2-methoxycarbonylbenzene-sulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt

was obtained in the yield of 95%, m.p. 159°C (decomp.).

Found, %: C 46.84, H 3.65, N 18.09, S 5.81. $C_{21}H_{20}N_7O_6SK$.

Calculated, %: C 46.93, H 3.72, N 18.25, S 5.96.

Example 46

Potassium salt of 1-(2-methoxycarbonylbenzene-sulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 45).

In a manner similar to that of Example 36, from potassium hydroxide and 1-(2-methoxycarbonylbenzene-sulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yield of 92%, m.p. 166°C (decomp.).

Found, %: C 44.22, H 3.43, Cl 6.15, N 17.02. $C_{21}H_{19}ClN_7O_6SK$.

Calculated, %: C 44.09, H 3.32, Cl 6.21, N 17.14.

Example 47

Potassium salt of 1-(2,5-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 46).

In a manner similar to that of Example 36, from potassium hydroxide and 1-(2,5-dichlorobenzene-sulphonyl)-3-(4-dimethylamino-6-isopropylidene-iminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 94% m.p. 168°C (decomp.).

Found, %: C 35.87, H 3.27, Cl 14.32, N 19.44, $C_{15}{}^5H_{16}Cl_2N_7O_4SK$.

Calculated, %: C 36.00, H 3.2, Cl 14.2, N 19.6.

Example 48

Potassium salt of 1-(2,5-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 47).

In a manner similar to that described in Example 36, from potassium hydroxide and 1-(2,5-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yield of 93%, m.p. 153°C (decomp.).

Found, %: C 37.29, H 3.43, Cl 13.90, N 19.21. $C_{16}H_{18}Cl_2N_7O_4SK$.

Calculated, %: C 37.75, H 3.5, Cl 13.81, N 19.06.

Example 49

Potassium salt of 1-(2,5-dichlorobenzenesulphonyl-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 48).

In a manner similar to that of Example 36 hereinbefore, from potassium hydroxide and 1-(2,5-dichlorobenzenesulphonyl-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the yield of 95%, m.p. 178°C (decomp.).

Found, %: C 41.69, H 2.95, Cl 12.81, N 17.76. $C_{19}H_{16}Cl_2N_7O_4SK$.

Calculated, %: C 41.6, H 2.92, Cl 12.95, N 17.88.

Example 50

Potassium salt of 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 49).

In a manner similar to that of Example 36 hereinbefore, from potassium hydroxide and 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea the

above-mentioned salt was obtained in the yield of 96%, m.p. 163°C (decomp.).

Found, %: C 35.91, H 3.12, Cl 14.08, N 19.78. $C_{15}H_{18}Cl_2N_7O_4SK$.

Calculated, %: C 36.00, H 3.2, Cl 14.2, N 19.6.

Example 51

Potassium salt of 1-(2,6-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 50).

In a manner similar to that described in Example 36, from potassium hydroxide and 1-(2-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the yield of 95%, m.p. 162°C (decomp.).

Found, %: C 37.50, H 3.61, Cl 13.74, N 18.89, $C_{16}H_{18}Cl_2N_7O_4SK$.

Calculated, %: C 37.35, H 3.5, Cl 13.81, N 19.07.

Example 52

Potassium salt of 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 51).

In a manner similar to that of Example 36 hereinbefore, from potassium hydroxide and 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-identified salt was obtained in the yield of 91%, m.p. 169°C (decomp.).

Found, %: C 41.52, H 2.88, Cl 12.76, N 17.71. $C_{19}H_{16}Cl_2N_7O_4SK$.

Calculated, %: C 41.6, H 2.92, Cl 12.95, N 17.88.

Example 53

Diethylethanolammonium salt of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 52).

To a solution of 1.8 g (0.015 mol) of diethylethanolamine in 20 ml of water 4.3 g (0.1 mol) of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea were portion-wise added under stirring. The reaction mixture was stirred at a temperature of 40-45°C for 3 hours till dissolution of sulphonylurea. The resulting reaction mass was filtered, water evaporated under a reduced pressure at a temperature of not more than 50°C. The oily residue was 2 times washed with ether to remove the excess of diethylethanolamine, dried in vacuum to a constant weight at room temperature to give 5.4 g (100%) of the above-mentioned salt.

Found, %: C 46.48, H 5.97, N 20.87, Cl 6.92.
$C_{21}H_{33}ClN_8O_5S$.

Calculated, %: C 46.28, H 5.87, N 20.57, Cl 6.52.

Example 54

Diethylethanolammonium salt of 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 53).

In a manner similar to that described in the foregoing Example 53, from diethylethanolamine and 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the form of an oily residue with the yield of 92%.

Found, %: C 47.45, H 6.60, Cl 6.70, N 20.38, S 6.01.
$C_{22}H_{35}ClN_8O_5S$.

Calculated, %: C 47.21, H 6.27, Cl 6.36, N 20.01, S 5.73.

Example 55

Diethylethanolammonium salt of 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 54).

In a manner similar to that described in Example 53, from diethylethanolamine and 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 94.5%.

Found, %: C 50.39, H 5.18, Cl 6.31, N 18.54. $C_{25}H_{33}ClN_8O_5S$.

Calculated, %: C 50.72, H 5.58, Cl 6.00, N 18.93.

Example 56

Diethylethanolammonium salt of 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 55).

In a manner similar to that described in Example 53 hereinbefore, from diethylethanolamine and 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 96%.

Found, %: C 47.50, H 5.48, Cl 11.65, N 18.03. $C_{25}H_{32}Cl_2N_8O_5S$.

Calculated, %: C 47.85, H 5.10, Cl 11.32, N 17.86.

Example 57

Diethylethanolammonium salt of 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-iospropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 56).

In a manner similar to that of Example 53, from diethylethanolamine and 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was

obtained in the form of an oily residue in the yield of 94%.

Found, %: C 45.79, H 5.80, N 22.31, S 5.48. $C_{21}H_{33}N_9O_7S$.

Calculated, %: C 45.40, H 5.94, N 22.70, S 5.76.

Example 58

Diethylethanolammonium salt of 1-(2-nitrobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 57).

In a manner similar to that described in Example 53, from diethylethanolamine and 1-(2-nitrobenzenesulphonyl-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 98%.

Found, %: C 46.11, H 6.50, N 22.51, S 5.90. $C_{22}H_{35}N_9O_7S$.

Calculated, %: C 46.40, H 6.15, N 22.14, S 5.62.

Example 59

Diethylethanolammonium salt of 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 58).

In a manner similar to that described in Example 53, from diethylethanolamine and 1-(2-nitrobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 96%.

Found, %: C 50.02, H 5.91, N 21.32, S 5.75. $C_{23}H_{36}N_8O_7S$.

Calculated, %: C 49.75, H 5.47, N 20.90, S 5.31.

Example 60

Diethylethanolammonium salt of 1-(2-methoxycarbonylbenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 59)

In a manner similar to that described in Example 53, from diethylethanolamine and 1-(2-methoxycarbonylbenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-identified salt was obtained in the form of an oily residue in the yield of 92%.

Found, %: C 48.21, H 6.72, N 20.01, S 6.10. $C_{23}H_{36}N_8O_7S$.

Calculated, %: C 48.59, H 6.31, N 19.72, S 5.63.

Example 61

Diethylethanolammonium salt of 1-(2-methoxycarbonylbenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 60).

In a manner similar to that of Example 53 hereinbefore, from diethylethanolamine and 1-(2-methoxycarbonylsulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 94%.

Found, %: C 49.12, H 6.14, N 18.95. $C_{24}H_{38}N_8O_7S$.

Calculated, %: C 52.60, H 5.84, N 18.18.

Example 62

Diethylethanolammonium salt of 1-(2-methoxycarbonylbenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 61).

In a manner similar to that of Example 53 hereinbefore, from diethylethanolamine and 1-(2-methoxycarbonylbenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the

above-mentioned salt was obtained in the form of an oily residue in the yield of 94.5%.

Found, %: C 52.93, H 6.20, N 18.50, $C_{21}H_{21}N_7O_6S$.

Calculated, %: C 52.60, H 5.84, N 18.18.

Example 63

Diethylethanolammonium salt of 1-(2-methoxycarbonyl-benzenesulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 62).

In a manner similar to that of Example 53, from diethylethanolamine and 1-(2-methoxycarbonylbenzene-sulphonyl)-3-[4-dimethylamino-6-(2-chloro)-benzylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 93%.

Found, %: C 49.59, H 5.01, Cl 5.06, N 16.92, $C_{21}H_{20}ClN_7O_6S$.

Calculated, %: C 49.81, H 5.38, Cl 5.46, N 17.22.

Example 64

Diethylethanolammonium salt of 1-(2,5-dichloro-benzenesulphonyl)-3-(4-dimethylamino-6-iso-propylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 63).

In a manner similar to that of Example 53, from diethylethanolamine and 1-(2,5-dichlorobenzene-sulphonyl)-3-(4-dimethylamino-6-isopropylidene-iminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 92%.

Found, %: C 43.94, H 5.98, Cl 12.60, N 19.70. $C_{21}H_{32}Cl_2N_8O_5S$.

Calculated, %: C 43.52, H 5.53, Cl 12.26, N 19.34.

Example 65

Diethylethanolammonium salt of 1-(2,5-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 64).

In a manner similar to that of Example 53 hereinbefore, from diethylethanolamine and 1-(2,5-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 92.5%.

Found, %: C 44.89, H 6.02, Cl 12.34, N 19.21. $C_{22}H_{34}Cl_2N_8O_5S$.

Calculated, %: C 44.52, H 5.73, Cl 11.97, N 18.89.

Example 66

Diethylethanolammonium salt of 1-(2,5-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 65).

In a manner similar to that of Example 53, from diethylethanolamine and 1-(2,5-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 95%.

Found, %: C 48.08, H 5.48, Cl 11.60, N 18.11. $C_{25}H_{32}Cl_2N_8O_5S$.

Calculated, %: C 47.85, H 5.10, Cl 11.32, N 17.86.

Example 67

Diethylethanolammonium salt of 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 66).

Likewise in Example 53 hereinbefore, from diethylethanolamine and 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylidene-

iminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 97.5%.

Found, %: C 43.14, H 5.19, Cl 11.85, N 19.01. $C_{21}H_{32}Cl_2N_8O_5S$.

Calculated, %: C 43.52, H 5.53, Cl 12.26, N 19.34.

Example 68

diethylethanolamine salt of 1-(2,6-dichlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 67).

Likewise in Example 53, from diethylethanolamine and 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained in the form of an oily residue in the yield of 96.5%.

Found, %: C 44.19, H 5.31, Cl 11.51, N 18.59. $C_{22}H_{34}Cl_2N_8O_5S$.

Calculated, %: C 44.52, H 5.73, Cl 11.97, N 18.89.

Example 69

Diethylethanolammonium salt of 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound 68).

In a manner similar to that described in Example 53 hereinbefore, from diethylethanolamine and 1-(2,6-dichlorobenzenesulphonyl)-3-(4-dimethylamino-6-benzylideneiminooxy-1,3,5-triazin-2-yl)-urea the above-mentioned salt was obtained comprising an oily residue in the yield of 98%.

Found, %: C 47.49, H 4.85, Cl 10.93, N 17.50. $C_{25}H_{32}Cl_2N_8O_5S$.

Calculated, %: C 47.85, H 5.10, Cl 11.32, N 17.86.

Example 70

The compounds according to the present invention were subjected to tests of their biological activity. To this end, the effect of representatives of these compounds, i.e. 1-(2-chlorobenzenesulphonyl)-3-(4-dimethylamino-6-isopropylideneiminooxy-1,3,5-triazin-2-yl)-urea (Compound I) and 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea (Compound 2) was studied relative to the growth and evelopment of sproutings of corn and cucumber. Under laboratory experiment conditions the plants were grown on soils in 0.5 kg (capacity) vessels filled with a mixture soil-sand-peat (3:1:1). In the case of pre-sprouting application, the compounds were ingroduced right after seeding by way of spraying over the soil surface. In the case of after-sprouting application the plants in the phase of 2 leaves were sprayed with the test compounds. An aqueous solution in the amount of 10 ml containing 0.00062% of the active principle was used for every vessel which corresponded to the application rate of 20 g/ha.

As standard reference compounds Gibberelin and Atrazin were used.

The biological activity was assessed by the stem length increment, amount of green above-ground mass, rate of appearance and growth of young leaves relative to the control (without the soil treatment) 3-4 weeks after the treatment. Repetition in variants was 4 times.

The experiment results are shown in Tables 2 to 4 as percentage of the control.

Table 2

Effect of Compound I on the Growth of Corn Stem in the Dose of 20 g/ha

Time of assessment (day since the sprouting moment)	6	8	10	13	15	17	21
Stem height, % of the control	135	144*	125*	123*	123*	117*	109

Table 3

Effect of Compound I on the Rate of Development of Young Corn Plants in the Dose of 20 g/ha

Time of asessment (day since the Sprouting moment)	Leaf length in the upper tier, % of the control	Leaf width in the upper tier (leaf middle portion), % of the control
17	125*	128*

Table 3 (continued)

1	2	3
28	153*	178*
38	173	202*

Table 4

Effect of Compounds 1 and 2 on the Amount of Above-ground Mass of Sproutings of Corn and Cucumber 3 Weeks after Sprouting

Moment (%of the non-treated control plants)				
Compound dose, g/ha	1,000	1,000	50	20
Culture	c o r n			
Compound 1	-	114	116	142
Culture	C u c u m b e r			
Compound 1	116	162*	104	-
Compound 2	123	132*	130*	-

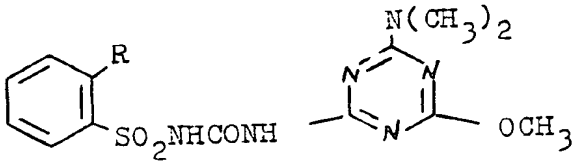
NOTE: * - certain deviation from the control at P=0.95.

As it follows from the data shown in Tables 2 and 3, compound I in the dose of 20 g/ha stimulates the growth of corn stem at earlier stages of the development of young corn plants, wherefore the size of leaves of the uppermost (at the moment of measurement) tier is substantially greater than in the control. According to the data of Table 4, acceleration of growth of sproutings of corn and cucumber results in that the biomass of the plants grown on the soil treated with compounds 1 and 2 is considerably greater than the biomass of the control plants.

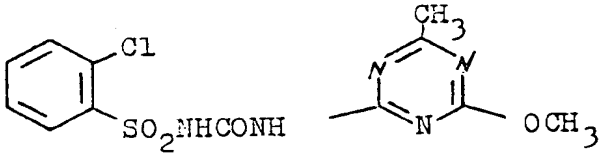
Example 71

The biological activity of substituted phenylsulphonyltriazinylureas was evaluated by their effect on the growth of

sproutings of corn and cucumber. The procedure of testing was similar to that described in the foregoing Example 70. As an indicator of acceleration of the development of sproutings there was used the weight of the above-ground mass of three-weeks sproutings relative to the control (above-ground mass of sproutings grown on the untreated soil). The comparison of the biological activity was effected with compounds having a similar structure possessing herbicidal and growth-regulating activity and corresponding to the formula:



wherein R = Cl (compound A), R = CO_2CH_3 (compound B) and with the herbicide Glin (active principle chlorosulphurone)



as well as with the known plant growth stimulant Gibberilin and corn herbicide and growth stimulan Atrazin (6-isopropyl-amino-2-chloro-4-ethylamino-1,3,5-triazine). The results are shown in Table 5 hereinbelow.

Table 5

Effect of Substituted Phenylsulphonyltriazin/yl ureas on Growth of Sproutings of corn and cucumbers

Compound No.	Corn		Cucumber	
	Dose, g/ha			
	100	20	100	20
1	116	142*	162*	102
2	136*	130*	132*	125
3	128*	103	96	143*
4	97	104	151*	109
5	106	114	98	147*
6	92	136*	131*	111
7	131*	123	115	98
8	100	109	95	139*
9	136*	127*	102	146*
10	105	121	108	155*
11	148*	95	92	140*
12	121	154*	113	88
13	98	97	136*	116
14	90	141*	123	120
15	118	102	120	148*
16	89	135*	98	109
17	127*	125	146*	122
Compound A	47*	83	64*	90
Compound B	31*	60*	20*	53*
Glin	0*	6*	0*	8*
Gibberelin	91	101	86	95
Atrazin dose of 1kg/ha	123*	0,5 kg/ha 114	-	-

* Certain deviation from the control at P = 0.95

From the data shown in Table 5 it follows that the compounds according to the present invention cause a certain growth stimulation of the above-earth mass of both corn and cucumbers, whereas compounds A, B and Glin are characterized by growth inhibition or retardation effect.

Gibberelin, while causing elongation of the stem, produced no positive effect on the biomass of the above-eart part of the plant, wherefore they were formed thinned and lodging.

Atrazin had its effect similar to that produced by the compounds according to the present invention, but in doses by 10 and 25 times higher.

Example 72

The effect of compounds 52 and 53 on the growth and development of most widespread weeds was studied. The procedure of carrying out the experiments was similar to that described hereinabove. The effect of the compounds on the growth and development of weeds was assessed by the weight of the biomass of the above-earth part of the plants 3 weeks after sowing. The preparation in the form of an aqueo-glycolic solution was introduced into the soil prior to seeding. The results are shown in Table 6 as percentage of the control (without the soil treatment).

Table 6

Effect of Compounds 52 and 53 on the Growth of Weeds

Weed variety	Dose of the compound, g/ha			
	Compound 52		Compound 53	
	100	20	100	20
1	2	3	4	5
Pigweed	88	97	81	105
Barnyard millet	75*	89	79	90
Bristle grass	82	107	94	100
Green amaranth	93	102	106	107
Matricary	96	103	106	97

* - Certain deviation from the control at P = 0.95.

From the above-given data it follows that compounds 52 and 53 insignificantly affect the growth and development of weeds in early stages of organogenesis, i.e. they selectively stimulate the growth of certain farm crops placing tham into a more favourable condition in the case of competition with weeds.

Example 73

The effect of compounds 52 and 53 according to the present invention was assessed in respect of weed-contamination and yield of corn under field conditions. These compounds were employed as water-glycol solutions in the case of presprouting introduction into the soil in the doses of 20 and 50 g/ha as calculated for the active principle.

The test plot area was 70 m^2, repetition of the treatment- 4 times. The plot soil was dark-grey, podzolized, sandy-loam, humus content 1.5%, pH = 4.0. The main prevailing varieties of weeds on the test plot: matricary, shepherd's purse, water pepper, chickweed, field horsetail, couch grass. The following results were obtained: in 1985 the yield of the above-ground mass in the case of using compound 52 in the dose of 20 g/ha was 149% of the control, in the dose of 50 g/ha - 176%; for both doses the weed-contamination was reduced by 98%. A similar result was obtained in 1986. In this case the weed-contamination was reduced by 85% for the dose of 20 g/ha and by 72% for the dose of 60 g/ha. The yield of the silage mass was 136% of the control (for the dose of 50 g/ha). The effect of these compounds was revealed in inhibition, to the same extent, of both one-year dicotyledonous and graminous weeds. The use of

compound 53 in the dose of 20 g/ha resulted in the yield gain of green mass of corn by 173 c/ha and in the dose of 40 g/ha - by 86 c/ha. The total yield was 120 c/ha ($MED^{*}_{0.5}$ = 82 c/ha).

*MED - minimum essential difference.

It is obvious that the use of Glin, highly toxic in respect of corn and compounds A and B inhibiting the growth of corn under field conditions is inexpedient (Table 5).

Example 74

The effect of compound 53 was studied in a field experiment for weed-contamination and yield of wheat and barley.

The compound 53 in the form of an aqueo-glycolic solution was used in the pre-sprouting stage of application in the doses of 10 and 20 g/ha as calculated for the active principle. The test plot area was 36 m^2, repetition of the treatment - 4 times. The plot soil was common chernozem, clayed loam with the humus content of 4.5%, pH = 7.0. The basic prevailing varieties of weeds on the test plot: bristle grass, pigweed, stitchwort species, wild buckwheat, field pennycress, green amaranth, shepherd's purse, corn bindweed, field horsetail, sow thistles. The following results were obtained. In the dose of 10 g/ha compound 53 caused death of 45% of weeds in sowings of winter wheat, the yield gain was 8.4 c/ha. The standard reference was Glin - 2.1 c/ha (the yield in the control - 25 c/ha, $MED_{0.5}$ - 4.0 c/ha). In barley sowings compound 53 caused death of 42% and 58% of weeds for the doses of 10 and 20 g/ha respectively. The yield gain was 0.5 c/ha and 5.2 c/ha respectively. The standard reference Glin (10 g/ha) resulted in the

yield gain of 2.9 c/ha (the yield in the control was 25.3 c/ha $MED_{0.5}$ - 2.0 c/ha).

Similar results were obtained in the study of the biological activity of sodium and potassium salts of substituted phenylsulphonyltriazinyl ureas.

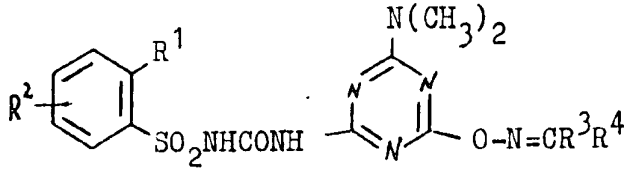
Example 75

The effect of the compounds according to the present invention was studied in respect of the yield of cotton - compounds 2, 9, 10, 11, 14.

The preparation of these compounds in the form of an aqueous emulsion with a surfactant employed in the amount of 0.1% by mass at the rate of the working liquid application of 500 l/ha were applied onto cotton plants in the phase of bud-formation by way of sprinkling. The size of the test plot was 3 m^2, repetition of the treatment - 3 times. The variety of cotton - Tashkent-1. The obtained results are shown in Table 7 hereinbelow.

Table 7

Comparative Assessment of Agents Containing Substituted Ureas of the General Formula



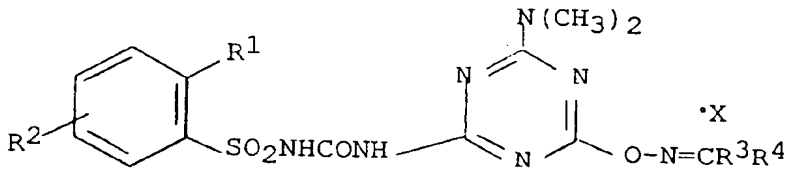
as to their Effect on the Yield of Raw Cotton

Compound No.	agents R^2	R^1	R^3	R^4	Dose, g/ha 10 c/ha	10 % of the control	50 c/ha	50 % of the control	100 c/ha	100 % of the control
2	H	Cl	CH_3	C_2H_5	39.4	142.9	38.9	140.8	33.5	121.3
9	H	CO_2CH_3	CH_3	C_2H_5	33.8	122.6	31.4	113.4	34.7	125.9
10	H	CO_2CH_3	H	C_2H_5	28.1	101.7	26.6	96.4	34.6	125.3
11	H	CO_2CH_3	H	C_6H_4Cl-2	45.6	165.2	40.6	147.2	34.8	126.2
14	Cl	Cl	H	C_6H_5	36.3	131.4	20.3	106.0	32.2	116.8
Control					27.6					

Note: $MED_{0.1}$ = 9.6 c/ha

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. Substituted phenylsulphonyltriazinyl ureas or salts thereof of the general formula:

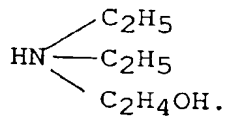


wherein: R^1 = Cl, NO_2COOCH_3

R^2 = H, Cl

R^3 = H, CH_3

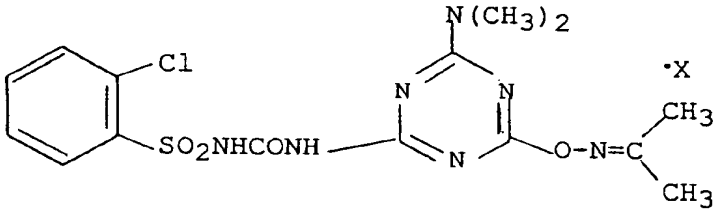
R_4 = CH_3, C_2H_5, C_6H_5, C_6H_4Cl-2, and

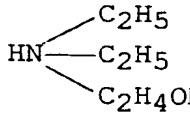
X is absent or X = K, Na, 

2. A composition for plant growth stimulation and inhibition, comprising as active ingredient a substituted phenylsulphonyltriazinyl urea or a salt thereof as defined in claim 1, together with a carrier therefor.

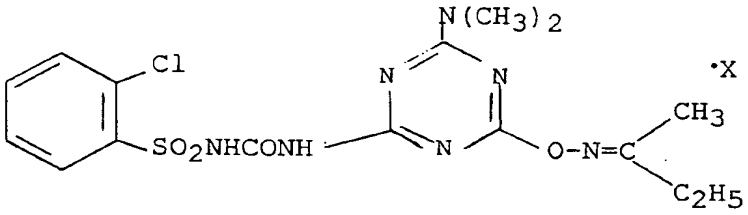
3. A composition according to claim 2, wherein the active ingredient is 1-(2-chlorobenzene-sulphonyl)-3-(4-dimethylamino-6-isopropylideneimino-oxy-1,3,5-triazin-2-yl)-urea or its potassium, sodium or diethylethanolamine salt of the general formula:

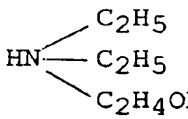
2036334



wherein X is absent, or X = K, Na,  .

4. A composition according to claim 2, wherein the active ingredient is 1-(2-chlorobenzenesulphonyl)-3-[4-dimethylamino-6-(α-methyl)-propylideneiminooxy-1,3,5-triazin-2-yl]-urea or its potassium, sodium or diethylethanolamine salt of the general formula:



wherein X is absent, or X = K, Na,  .